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<b>PRE-APPEAL BRIEF REQUEST FOR REVIEW</b>		Docket Number (Optional) <b>YOR920030299US1</b>	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents P O Box 1450 Alexandria VA 22313-1450" [37 CFR 1.8(a)]  on _____  Signature _____  Typed or printed name _____		Application Number  <div style="text-align: center; font-size: 1.2em;"><b>10/661,322</b></div>	Filed  <div style="text-align: center; font-size: 1.2em;"><b>September 12, 2003</b></div>
First Named Inventor  <div style="text-align: center; font-size: 1.2em;"><b>Parida et al.</b></div>		Art Unit  <div style="text-align: center; font-size: 1.2em;"><b>2129</b></div>	
Examiner  <div style="text-align: center; font-size: 1.2em;"><b>Peter D. Coughlan</b></div>			
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s).          Note: No more than five (5) pages may be provided.</p>			
I am the  <input type="checkbox"/> applicant/inventor  <input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96)  <input checked="" type="checkbox"/> attorney or agent of record Registration number <b>36,597</b>		<div style="text-align: center;">             Signature  <b>Kevin M. Mason</b>            Typed or printed name  <b>(203) 255-6560</b>            Telephone number  <b>December 5, 2006</b>            Date         </div>	
<input type="checkbox"/> attorney or agent acting under 37 CFR 1.34 Registration number if acting under 37 CFR 1.34 _____			
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
<input type="checkbox"/> *Total of _____ forms are submitted.			

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P O Box 1450, Alexandria, VA 22313-1450

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): Parida et al  
Docket No.: YOR920030299US1  
Serial No.: 10/661,322  
Filing Date: September 12, 2003  
Group: 2129  
Examiner: Peter D. Coughlan  
  
Title: Discovering Permutation Patterns

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MEMORANDUM IN SUPPORT OF  
PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The present invention and prior art have been summarized in Applicants' prior responses.

STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1 through 29 are presently pending in the above-identified patent application. Claims 1-29 were rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Claims 1-17, 20-26, and 29 were rejected under 35 U.S.C. §102(b) as being anticipated by Floratos, "DELPHI: A Pattern-based Method for Detecting Sequence Similarity," claims 18 and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Floratos, in view of Savitch, "Problem Solving with C++," and claims 19 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Floratos, and Savitch, and further in view of Fredman, "Two Applications of a Probabilistic Search Technique: Sorting X+Y and Building Balanced

Search Trees.”

### Section 101 Rejections

Claims 1-29 were rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. In particular, the Examiner asserts that the invention has not been limited to a substantial practical application. In the final Office Action, the Examiner asserts that discovering permutations has no practical purpose, and that no function or application has been stated for the invention.

The Supreme Court has stated that the “[t]ransformation and reduction of an article ‘to a different state or thing’ is the clue to patentability of a process claim.” *Gottshalk v. Benson*, 409 U.S. 63, 70, 175 U.S.P.Q. (BNA) 676 (1972). In other words, claims that require some kind of transformation of subject matter, which has been held to include intangible subject matter, such as data or signals, that are representative of or constitute physical activity or objects have been held to comply with Section 101. See, for example, *In re Warmerdam*, 31 U.S.P.Q.2d (BNA) 1754, 1759 n.5 (Fed. Cir. 1994) or *In re Schrader*, 22 F.3d 290, 295, 30 U.S.P.Q.2d (BNA) 1455, 1459 n.12 (Fed. Cir. 1994).

Thus, as expressly set forth in each of the independent claims, the claimed methods or system describe discovering permutation patterns from an input string having a plurality of characters, each character being from an alphabet, and transform the input string to permutation patterns. This transformation to permutation patterns provides a useful, concrete and tangible result.

Contrary to the Examiner’s assertion that no function or application has been stated for the invention, Applicants note that the Background section of the present disclosure describes how such permutation patterns are utilized in medical applications related to genes and proteins. The final result of the cited claims, i.e., permutation patterns, are useful, concrete and tangible results.

Applicants submit that each of claims 1-29 are in full compliance with 35 U.S.C. §101, and accordingly, respectfully request that the rejection under 35 U.S.C. §101 be withdrawn.

Independent Claims 1, 20 and 29

Independent claims 1, 20, and 29 were rejected under 35 U.S.C. §102(b) as being anticipated by Floratos. Regarding claim 1, the Examiner asserts that Floratos teaches “using changes in the names to determine the permutation patterns” (page 457, C2:5-15; ‘Permutation patterns’ of applicant are equivalent to ‘K’ of Floratos). In the final Office Action, the Examiner asserts that

(Floratos, p 462, C1:5 through C2:4) Floratos explains the number of times that a residue R appears in P, which is the bases of permutation of a pattern. Floratos also illustrates a quantitative result which is the frequency of a specific pattern (or permutation). Another example of permutation is on page 457, C1:17-25. Floratos illustrates a backbone (or permutation) of ‘100111’ which is an example of the string of ‘A DEF.’ If Floratos were to ‘change’ the name to ‘AB DEF’ then the backbone (or permutation) would be ‘110111’ (Page 17, last paragraph, of the final Office Action.)

Applicants note that Floratos is directed to a different problem than the present disclosure. Floratos is directed to “identifying *sequence similarity* between a query sequence and a database of proteins” (Page 455, first paragraph; emphasis added.) Floratos searches for an *ordered sequence in a string*. The claims of the present disclosure are directed to *discovering permutation patterns*. As would be apparent to a person of ordinary skill in the art, permutation patterns indicate that the patterns are related to a *non-ordered set of characters*. For instance, dictionary.com teaches that the permutations of (1,2,3) are (1,2,3) (2,3,1) (3,1,2) (3,2,1) (1,3,2) (2,1,3)

The examples presented by the Examiner, however, are *not permutation patterns*, as would be understood by a person of ordinary skill in the art. Regarding the Examiner’s assertion that Floratos explains the number of times that a residue R appears in P, which is the bases of permutation of a pattern and illustrates a quantitative result which is the frequency of a specific pattern (or permutation), Applicants note that, in the text cited by the Examiner, Floratos teaches that

during the search phase, two mechanisms are available for prohibiting the association of two sequences along a potentially low-complexity region. The first permits the use of only a “linguistically rich” subset of the patterns discovered during information gathering. In particular, for each pattern *P*, we define its variability  $\nu(P)$  as

$$\nu(P) = \frac{\max_R \{\text{number of times that the residue } R \text{ appears in } P\}}{\text{total number of positions in } P \text{ covered by residues}}$$

and allow the user access to a global parameter  $V$  which dictates that a pattern  $P$  is employed in the search phase only if  $v(P) < V$ .

The second mechanism allows the disregarding of local similarities of low informational content.

(Page 462, column 1, lines 5-24.)

Regarding the Examiner's assertion that another example of permutation is on page 457, C1:17-25, where Floratos illustrates a backbone (or permutation) of '100111' which is an example of the string of 'A. DEF,' Applicants note that Floratos teaches that,

given a pattern  $P$ , the *backbone* of  $P$  is defined as a string over the alphabet  $\{1, 0\}$  obtained from  $P$  by turning every residue of  $P$  into the character "1" and every don't-care into the character "0." For example, the backbone of the pattern  $P = "A.DFE"$  introduced above is the string  $B = "100111"$ . Backbones partition the set of patterns into equivalent classes, with each class containing all of the patterns sharing the same backbone. A pattern with backbone  $B$  is designated as a  $B$ -pattern.

(Page 457, column 1, lines 17-25.)

Neither of these citations are examples of permutation patterns, as defined above and as would be understood by a person of ordinary skill in art. Independent claims 1, 20, and 29 require using changes in the names to determine the *permutation patterns*.

Thus, Floratos does not disclose or suggest using changes in the names to determine the permutation patterns, as required by independent claims 1, 20, and 29.

#### Additional Cited References

Savitch was also cited by the Examiner for its disclosure of wherein the at least one character is a single character and wherein the step of selecting further comprises selecting a portion of the input string that differs from the previously selected portion of the input string by moving a window one character, from the previously selected portion, along the input string, the window selecting the new portion of the input string. Applicants note that Savitch is directed to a program using an array. Savitch does not address the issue of using changes in names to determine permutation patterns.

Thus, Savitch does not disclose or suggest using changes in the names to determine the permutation patterns, as required by independent claims 1, 20, and 29.

Fredman was also cited by the Examiner for its disclosure of wherein the sets of names are stored in a balanced search tree. Applicants note that Fredman is directed to a search method that translates into an insertion sort, and to the construction of probabilistically binary search trees. Fredman, however, does not address the issue of using changes in names to determine permutation patterns

Thus, Fredman does not disclose or suggest using changes in the names to determine the permutation patterns, as required by independent claims 1, 20, and 29.

Dependent Claims 2-19 and 21-28

Dependent claims 2-17 and 21-26 were rejected under 35 U.S.C. §102(b) as being anticipated by Floratos, claims 18 and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Floratos, in view of Savitch, and claims 19 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Floratos, and Savitch, and further in view of Fredman.

Claims 2-19 and 21-28 are dependent on claims 1 and 20, respectively, and are therefore patentably distinguished over Floratos, Savitch, and Fredman (alone or in any combination) because of their dependency from independent claims 1 and 20 for the reasons set forth above, as well as other elements these claims add in combination to their base claim.

All of the pending claims, i.e., claims 1-29, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below

The Examiner's attention to this matter is appreciated.

Respectfully submitted,



Kevin M. Mason  
Attorney for Applicants  
Reg. No. 36,597  
Ryan, Mason & Lewis, LLP  
1300 Post Road, Suite 205  
Fairfield, CT 06824  
(203) 255-6560

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